

Abstract

A unitized intake air delivery assembly is provided which minimizes the size of an engine by integrating the intake manifold and intake air heater within the cylinder head of the engine. In addition, an intake air  
5 heater is provided which can be easily mounted on existing engines with minimal expense and modifications. The air heater includes a heating element and a supporting frame wherein the heating element and substantially the entire heater frame is supported in the intake air passage formed by the delivery conduit and the intake air manifold. The frame  
10 includes a mounting flange of minimal thickness extending between the cylinder head and the air delivery conduit so as to minimize the impact of the air heater on the height of the engine. An electrical connection to the heating element is provided through a connector aperture formed in the side wall of the cylinder head.